Analysis of Raw Material Inventory Control Using Economic Order Quantity (Eoq) Method at Good Coffee Houses in Surabaya

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ABSTRACT

This research aims to analyze the management of raw material supplies at Rumah Kopi Baik Surabaya using the Economic Order Quantity (EOQ) method. Raw material inventory plays an important role in the smooth operation of a company, but inefficient management can cause wasted costs and disrupt the production process. The EOQ method is used to determine the optimal order quantity, so as to reduce storage and ordering costs for raw materials. The data used in this research was obtained through direct observation, interviews with business owners, and analysis of raw material purchase documents. Analysis is carried out to calculate EOQ, safety stock, reorder point (ROP), and total inventory cost (TIC). The research results show that the application of the EOQ method at Rumah Kopi Baik has succeeded in reducing storage costs and reducing order frequency. The total cost savings achieved are more significant compared to previously applied conventional methods. Implementing EOQ at Rumah Kopi Baik not only increases operational efficiency, but also has a positive impact on the company's profitability. With more optimal inventory management, Rumah Kopi Baik can meet customer demand without stock shortages or wasting raw materials.

Keywords: Economic Order Quantity (EOQ), Inventory Control, Storage Costs, Ordering Costs.

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INTRODUCTION

Raw material inventory plays a crucial role in maintaining the smooth running of a company's production process. According to Riyanto (2012:69), if inventory investment exceeds needs, the company will face increased costs such as interest, storage, maintenance, and the risk of damage, quality degradation, and obsolescence, which can ultimately reduce profits. Conversely, too little investment can lead to raw material shortages, hinder optimal production capacity, and have a negative impact on profitability. Therefore, it is important for companies to determine the right amount of inventory. According to Achmad Slamet (2007:51), togetherness is achieved by considering various aspects, such as the number of products, durability, production duration, storage facilities, storage costs, available capital, distribution needs, protection against raw material shortages, closing prices, and inventory risks.

One approach that is often used to manage raw material inventory efficiently is the Economic Order Quantity (EOQ) method. This method aims to determine the most economical order quantity by taking into account storage and ordering costs. By implementing EOQ, companies can minimize storage costs and ordering frequency, and prevent stock shortages that can disrupt production. Research shows that the EOQ method is effective in reducing inventory costs in various industries. For example, in the coffee industry, the application of EOQ has been proven to be able to reduce the cost of ordering and storing coffee raw materials more efficiently than conventional methods (Sukosyah et al., 2023). Therefore, the application of EOQ is a strategic step for Rumah Kopi Baik to manage raw material inventory so that the production process runs more efficiently with lower operational costs. Economic Order Quantity (EOQ) itself is a mathematical model used to determine the number of goods that must be ordered to meet projected needs by minimizing inventory costs (Fahmi, 2014:120). EOQ is an effective solution in managing raw material inventory in various industrial sectors, including the coffee sector. By utilizing this method, companies such as Rumah Kopi Baik can reduce inventory costs and ensure the availability of sufficient raw materials to support the continuity of the production process efficiently.

Rumah Kopi Baik is a company engaged in the coffee industry and is located in Surabaya, precisely at Jl. Pucang Asri I No. 5. Established in 2023, this company is engaged in coffee and tea processing, offering various flavors in every menu served. To support the smooth running of its production process, Rumah Kopi Baik requires sufficient availability of raw materials. Therefore, optimal management of raw material inventory is important.

Based on the results of initial observations, the management of raw material inventory at Rumah Kopi Baik is still not well planned. In its operations, this company implements a policy of continuously purchasing raw materials based on previous estimates, still relying on conventional calculation methods. When the stock of raw materials in the warehouse starts to run low, the company immediately makes

purchases in large quantities. However, this method often causes excess stock of raw materials in the warehouse, which can affect the efficiency of inventory management.

The following is data on the amount of coffee & tea raw material purchases at Rumah Kopi Baik in 2024 in June-October:

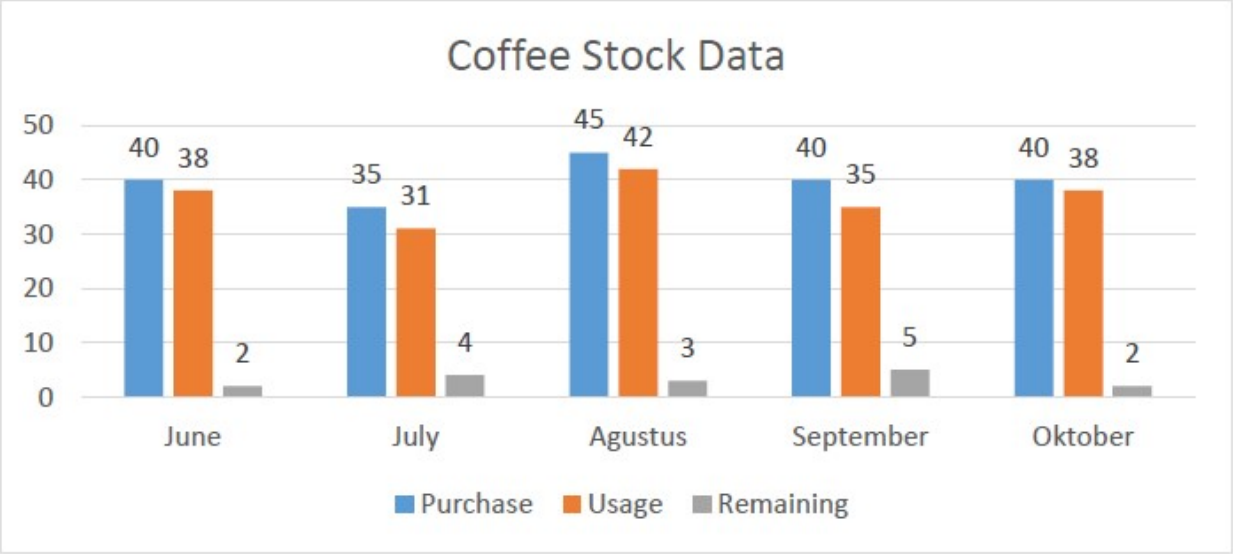


Figure 1. Purchase, Usage, and Stock of Coffee in the Raw Material Inventory Warehouse of Rumah Kopi Baik

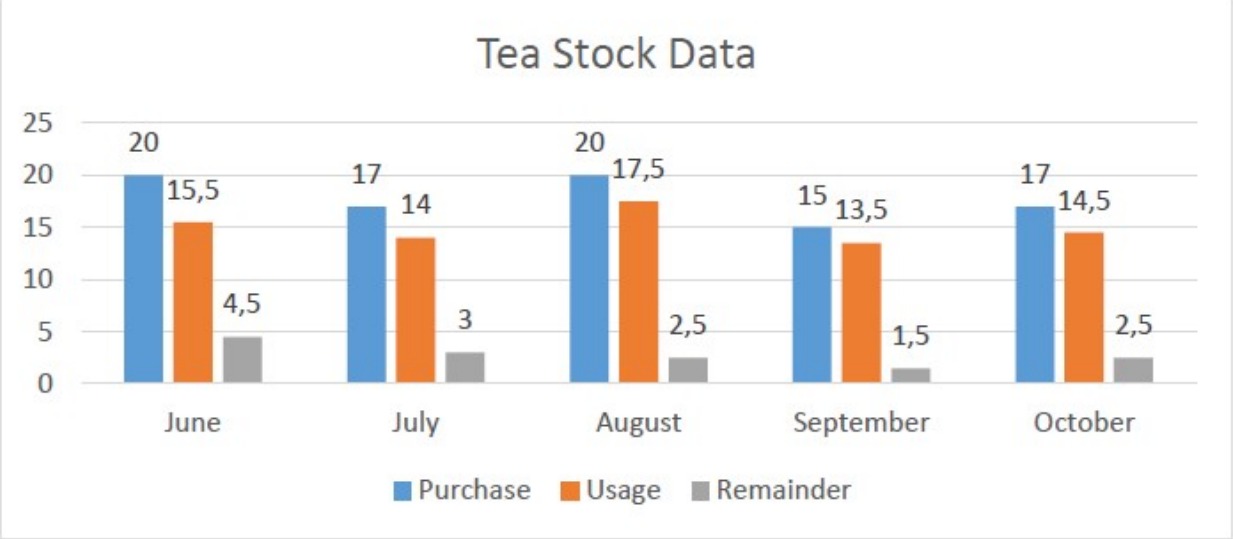


Figure 2. Purchase, Usage, and Stock of Tea in the Raw Material Inventory Warehouse of Rumah Kopi Baik

From the picture above, it can be seen that the purchase of raw materials often exceeds actual needs. During the period from June to October 2024, the total purchase of coffee raw materials reached 200 kg, with a usage of 184 kg, leaving 16 kg. Meanwhile, the purchase of tea raw materials during the same period was 89 kg, with a total usage of 75 kg, leaving 14 kg.

The data shows that the management of raw material inventory at Rumah Kopi Baik is still not optimal. Therefore, this analysis was conducted to improve the efficiency of raw material inventory management in this home industry every month. The excess of coffee and tea raw materials that occurs can have a detrimental impact on the company because the funds invested in inventory become quite large, and the waste of storage costs reduces profits. This confirms that the management of coffee and tea raw material inventory is an important challenge in the operations of Rumah Kopi Baik. This study aims to:

1. Analyze the application of the Economic Order Quantity (EOQ) method in managing raw material inventory at Rumah Kopi Baik.
2. Identify potential cost savings through the application of the EOQ method in managing raw material inventory.

Based on these problems, economical raw material procurement is an important step for Rumah Kopi Baik. With this background, the author is interested in exploring efficient raw material procurement strategies through a final assignment entitled "Analysis of Raw Material Inventory Control with the Economic Order Quantity (EOQ) Method at Rumah Kopi Baik in Surabaya."

LITERATURE REVIEW

Operational Management

Operational management is a series of processes or activities aimed at producing products through the transformation of inputs into outputs. In addition, production and operational management can be interpreted as an effort to manage and coordinate the use of various resources effectively and efficiently in order to create products or increase the utility value of these products (Kristanto et al., 2022).

Inventory Management

Inventory management involves the process of planning and controlling stock that includes raw materials, work in process, and finished products within an organization. The main goal is to ensure the availability of sufficient raw materials to support the smooth running of the production process without experiencing shortages, while reducing unnecessary storage costs (Susanto, 2018).

Inventory

Inventory is the stock of certain goods or resources used by a company. The inventory system is a series of policies and controls that aim to monitor stock levels, determine the amount that needs to be maintained, when stock should be replenished, and how much should be ordered. In the context of manufacturing, inventory typically includes goods that support or will become part of the company's final product (Assauri, 2016:225).

Economic Order Quantity (EOQ)

Heizer and Render define EOQ as a model designed to calculate the optimal order quantity for a product, so that inventory costs including storage and ordering costs can be minimized (Heizer and Render, 2008). EOQ is a mathematical model that aims to reduce ordering and storage costs by calculating the most efficient order quantity (Schroeder, 2000). Meanwhile, Tersine describes EOQ as a model that aims to find a balance between storage and ordering costs by determining the optimal order quantity in the inventory cycle (Tersine, 1994). The frequency of orders can be formulated as follows (Rifqi, 2010:40):

$$\mathrm{I} = \frac{D}{EOQ}$$

Where:

I : Purchase frequency in one year

D : Amount of raw material requirements for one year

EOQ : Amount of material purchased in one order

To calculate the amount of safety stock, as follows (Heizer and Rander, 2005):

$$SS = SD \times Z$$

Description:

SS = Safety Stock

SD = Standard deviation

Z = Standard normal deviation

The standard deviation calculation formula is as follows:

$$SD = \sqrt{\sqrt{\frac{\in(x-x)^2}{n}}}$$

Description:

SD : Standard Deviation

X : Amount of raw material usage

X back : Average amount of raw material usage

N : Period of raw material usage

It can be concluded that the Reorder Point (ROP) method or reorder point is the minimum limit of the amount of inventory that must be maintained. When the amount of inventory reaches this point, the company needs to immediately reorder to prevent stock shortages.

$$\mathbf{ROP = (D \times L) + SS}$$

Description:

ROP = Reorder

D = Daily Raw Material Requirements

L = Lead Time

SS = Safety Stock

Total Inventory Cost (TIC) refers to the total inventory costs incurred by the company. In other words, TIC is the result of combining the total cost of inventory management and the total cost of ordering (Kasmir, 2010:272). The formula can be expressed as follows:

$$TIC = (\frac{D}{Q} \times S) + (\frac{Q}{2} \times H)$$

Given:

D = Total purchase of raw materials

Q = Quantity of raw material purchases EOQ

S = Ordering costs per order

H = Storage costs per Kg of raw materials

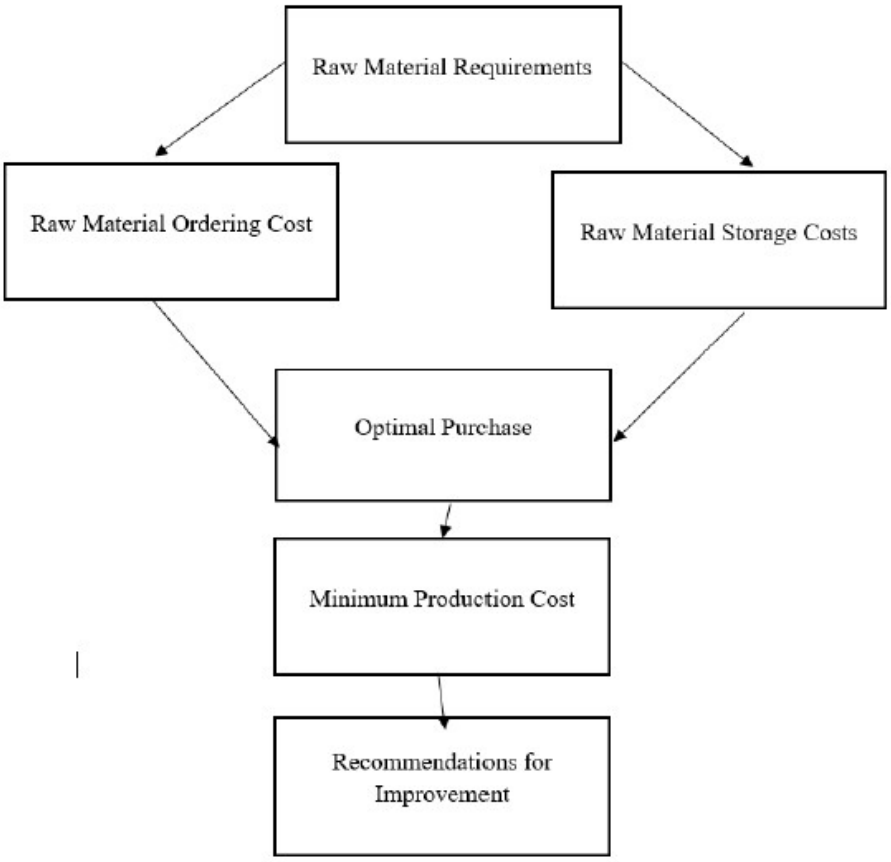
Warehouse Management

Warehouse management is an information system used to manage various activities in a warehouse. These activities include receiving, storing, moving, picking, and shipping goods. The release of goods from the warehouse includes several aspects, such as raw materials for production, semi-finished goods that will be further processed, and finished goods that are ready to be marketed. In some cases, warehouse management also includes the product packaging process before being distributed to consumers (Warman, 2012).

RESEARCH METHODS

This study uses quantitative with a descriptive approach. Descriptive research aims to describe or describe data related to raw material inventory control at Rumah Kopi Baik using the Economic Order Quantity (EOQ) method. The quantitative approach is used to analyze numerical data related to storage costs, ordering costs, and ordering frequencies obtained through EOQ calculations. This study uses field work research techniques. Data analysis techniques use EOQ (Economic Order Quantity) calculations, safety stock calculations, reorder point (ROP) calculations, and total inventory cost (TIC) calculations.

Conceptual Framework



RESULTS

Raw Materials

Before the production process is carried out, the production department requires production materials to produce coffee & tea products. The materials used can be seen in the following table:

Table 1. Raw Materials

No.	Product	Raw Materials	Auxiliary Materials
1.	Coffee Milk	Coffee	Steamer Milk
		Milk	Coffee Grinder
		Sugar	Water
			Cups
2.	Teh Tarik	Teh	Teapot
		Milk	Stainer
		Sugar	Glasses

Source: Rumah Kopi Baik

After the materials in the table above have been obtained, the next step is to carry out the production process which takes about 5-10 minutes to process before becoming a product that is ready to be served.

Production Process at Rumah Kopi Baik.

Table 2. Production Process

Coffee Milk	Teh Tarik
1. Take and select robusta coffee beans 2. Grind the coffee beans using a coffee grinder until smooth 3. Steam the milk using a steamer machine 4. Brew the ground coffee with hot water 5. Mix the brewed coffee with the steamer milk 6. The milk coffee is ready to be served	1. Take 1/2 pack of steamer tea 2. Brew the tea using hot water in a teapot 3. Pour the tea into a glass according to the measurement 4. Mix the tea with milk according to the measurement and stir until mixed 5. Add sugar to taste 6. Teh tarik is ready to be served

Source: Rumah Kopi Baik

In production activities, the company has previously adjusted the need for coffee and tea raw materials based on the planned demand projections. This is done so that the company can predict the amount of raw materials needed for the future production process. Based on the table below, the amount of raw material needed for 5 months can be seen, as well as the total costs incurred by the company to meet these needs. This data provides a clear picture of the company's expenses related to purchasing raw materials and helps in evaluating the efficiency of inventory management.

Table 3. Purchase and Use of Coffee and Tea Raw Materials in June-October 2024

No.	Month	Raw Materials	Purchase(Kg)	Usage(Kg)
1	June	Coffe	40	38
		Tea	20	15,5
2	July	Coffe	35	31
		Tea	17	14
3	August	Coffe	45	42
		Tea	20	17,5
4	September	Coffe	40	35
		Tea	15	13,5
5	October	Coffe	40	38
		Tea	17	14,5
TOTAL		**Kopi**	**200**	**184**
		Teh	**89**	**75**
AVERAGE		**Kopi**	**40**	**36,8**
		Teh	**17,8**	**15**

Source: Rumah Kopi Baik

Based on available data, the purchase of coffee and tea raw materials by Rumah Kopi Baik during the period from June to October 2024 reached a total of 200 kg for coffee and 89 kg for tea. The average purchase per transaction was recorded at 40 kg for coffee and 17.8 kg for tea. Meanwhile, the use of raw materials during the same period was recorded at 184 kg for coffee and 75 kg for tea. The average monthly use of raw materials was 36.8 kg for coffee and 15 kg for tea. These data indicate that there is a difference between the amount of purchases and the use of raw materials, which can lead to excess stock. Therefore, further analysis is needed to optimize inventory management and minimize related costs.

Ordering Cost

Ordering cost is the cost incurred to order goods or materials from the seller, starting from placing the order until the goods are received at the warehouse. Based on the results of the study, it is known that the ordering cost of Rumah Kopi Baik incurred ordering costs in the process of ordering coffee and tea raw materials in June-October 204, which was IDR 520,000 for coffee and IDR 231,400 for tea each month for the cost of shipping raw materials and in the period June-October 2024 Rumah Kopi Baik incurred a total cost for shipping of (IDR 520,000 + IDR 231,400) x 5 = IDR 3,757,000.

Storage Cost

Storage costs arise from storing raw materials. The storage costs for coffee and tea raw materials at Rumah Kopi Baik include electricity costs and salary costs. Data on the storage costs of coffee and tea raw materials in 2024 are as follows:

Table 4. Storage Costs in June-October 2024

Cost Types	Monthly	Per Fifth Month
Electricity Cost	Rp. 500.000	Rp. 2.500.000
Salary cost for 1 warehouse employee	Rp. 1.350.000	Rp. 6.750.000
Total	Rp. 1.850.000	Rp. 9.250.000

Source: Rumah Kopi Baik

Based on the table above, we can see that the cost of storing raw materials for coffee and tea at Rumah Kopi Baik each month reaches Rp. 1,850,000, while per fifth month it reaches Rp. 9,250,000. Where the electricity cost that must be spent at Rumah Kopi Baik per month is Rp. 500,000, the salary cost for 1 employee is Rp. 1,350,000. This storage cost must be spent every month to meet the business.

Procurement of raw materials for production process activities will not be separated from the accompanying inventory costs. Knowing the total inventory cost required during the production process in June-October 2024, and below is a table of the total cost of raw material inventory.

Table 5. Total Inventory Cost in June-October 2024

No.	Description	Amount
1.	Ordering Cost	Rp. 3.757.000
2.	Storage Cost	Rp. 9.250.000
Total Inventory Cost		Rp. 13.007.000

Source: Rumah Kopi Baik

Based on the table above, it is known that the amount of ordering raw materials for Coffee and tea is IDR 3,757,000, and the storage cost is IDR 9,250,000. So that the total cost of raw material inventory for coffee and tea is IDR 13,007,000.

Data Analysis

Analysis of raw material inventory control using EOQ

According to the company, the frequency of purchasing raw materials for five months is 5 purchases. The amount of raw materials needed is 184 kg for coffee and 75 kg for tea. the ordering cost in 2024 is IDR 3,757,000. and to measure the storage cost the formula is used:

$$\text{H coffee} = \frac{storage\ cost\ in\ five\ months}{amount\ of\ raw\ materials\ needed\ in\ five\ months}$$

$$= \frac{9.250.000}{184} = 50.271{,}7 \text{ Kg}$$

$$\text{H tea} = \frac{storage\ cost\ in\ five\ months}{amount\ of\ raw\ materials\ needed\ in\ five\ months}$$

$$= \frac{9.250.000}{75} = 123.333{,}3 \text{ Kg}$$

So the storage cost of coffee raw materials is IDR 50,271.7 / Kg and the storage cost of tea raw materials is IDR 123,333.3 / Kg. Purchase of raw materials based on the EOQ formula is as follows:

COFFEE

$$EOQ = \sqrt{\frac{2.D.S}{H}}$$

$$= \sqrt{\frac{2x168x520.000}{50.271{,}7}}$$

$$= \sqrt{\frac{174.720.000}{50.271{,}7}}$$

$$= 58{,}953 \text{ Kg}$$

TEA

$$EOQ = \sqrt{\frac{2.D.S}{H}}$$

$$= \sqrt{\frac{2x75x231.400}{123.333{,}3}}$$

$$= \sqrt{\frac{34.710.000}{123.333{,}3}}$$

$$= 16{,}775 \text{ Kg}$$

Based on the results of the calculation of raw material purchases using the EOQ formula, the Rumah Kopi Baik company will purchase 58.953 Kg of coffee and 16.775 Kg of tea. Estimated number of orders in one order according to:

$$I = \frac{D}{EOQ}$$

COFFEE

$$I = \frac{184}{58{,}953}$$

$$= 3{,}121$$

Rounded to 3 orders

TEA

$$I = \frac{75}{16{,}775}$$

$$= 4{,}470$$

Rounded to 4 orders

From the calculation above, the Home Industry company orders coffee 3 times in five months and tea 4 times in five months. So for the frequency of orders, either through the EOQ formula calculation or the frequency of Rumah Kopi Baik, there is a different difference and it is more efficient to use the EOQ formula with 3 orders for coffee and 4 orders for tea in the period June-October 2024, while for Rumah Kopi Baik, the purchase of coffee raw materials according to EOQ is 58.953 Kg and the purchase of tea raw materials according to EOQ is 16.775 Kg. Safety Stock Calculation

Safety Stock

Calculation is an important step to anticipate inventory shortages that can disrupt the smooth production process. To determine the amount of safety stock, the company must consider factors such as the desired service level, which in this case is 95%. This means that the company wants to have enough inventory reserves to meet customer demand 95% of the time. In other words, there is a 5% risk of inventory shortages. To calculate Safety Stock, the Z-score from the normal distribution is used, which at a service level of 95% is Z = 1.65. The higher the Z value, the greater the safety stock required to reduce the risk of inventory shortages:

Table 6. Calculation of Standard Deviation

Month	Raw Material	X	X	((x-x))	$((x-x))^2$
June	Coffee	38	36,8	1,2	1,44
	Tea	15,5	15	0,5	0,25
July	Coffee	31	36,8	-5,8	33,64
	Tea	14	15	-1	1
August	Coffee	42	36,8	5,2	27,04
	Tea	17,5	15	25	6,25
September	Coffee	35	36,8	-1,8	3,24
	Tea	13,5	15	-1,5	2,25
October	Coffee	38	36,8	1,2	1,44
	Tea	14,5	15	10,5	0,25
Amount	Coffee	**184**			**66,8**
	Tea	**75**			**10**

Source: Rumah Kopi Baik

Based on the results of the standard deviation calculation, we can see the average demand for raw materials. The demand for raw materials at Rumah Kopi Baik is 184 kg for coffee and 75 kg for tea with an average of 36.8 kg of coffee and 15 kg of tea. It can be seen with the formula below:

COFFEE

$$X\frac{d}{n} = \frac{184}{5} = 36{,}8$$

$$SD = \sqrt{\sqrt{\frac{\in(x-x)^2}{n}}}$$

$$= \sqrt{\sqrt{\frac{66{,}8}{5}}} = 13{,}36$$

TEA

$$X\frac{d}{n} = \frac{75}{5} = 15$$

$$SD = \sqrt{\sqrt{\frac{\in(x-x)^2}{n}}}$$

$$= \sqrt{\sqrt{\frac{10}{5}}} = 1{,}41$$

With the assumption that Rumah Kopi is good at implementing inventory that meets 95% of demand and reserve inventory of 5%, so that Z can be obtained with a normal curve of 1.65 standard deviations above the average. Calculation of safety stock:

COFFEE

Ss = SD X Z
= 13,36 X 1.65
= 22,044(Rounded to 22 Kg)

TEA

Ss = SD X Z
= 1,41 X 1.65
= 2,32 (Rounded to 2 Kg)

So the raw material stock that must be provided by Rumah Kopi Baik as a safety stock is 22 kg for coffee and 2 kg for tea. So that the coffee and tea production process does not stop or get hampered due to running out of raw materials.

Calculation of ordering time (Re Order Point)

The lead time required by Rumah Kopi Baik to wait for the arrival of the ordered raw materials is an average of 5 days. With an average number of working days of 153 days in 5 months. Before calculating the amount of ROP (Re Order Point), it is necessary to find the level of raw material usage per day. To determine the level of raw material usage per day, it can be calculated in the following way:

COFFEE

$$AU = \frac{d}{t}$$

$$= \frac{184}{153}$$

$$= 1{,}202 \text{ Kg}$$

TEA

$$AU = \frac{d}{t}$$

$$= \frac{75}{153}$$

$$= 0{,}49 \text{ Kg}$$

So if we look at the calculation results above, the Rumah Kopi Baik company has a daily demand of 1,202 kg of coffee and 0.49 kg of tea to be produced. To avoid waste or excess raw materials in the warehouse, the company should reorder after the raw materials in the warehouse are low. We can see the formula below as follows:

COFFEE	TEA
ROP = (d x L) + SS	ROP = (d x L) + SS
= (1,202 X 5) + 22	= (0,49 X 5) + 2
= 28,01 Kg	= 4,45 Kg

We can see the results of the ROP (Re Order Point) calculation above that the company will reorder if the need for raw materials in the warehouse is 28.01 kg of coffee and 4.45 kg of tea. If the need for raw materials in the warehouse is still quite a lot, the company should not reorder. Because it is feared that it can cause the accumulation of raw materials in the warehouse.

Total Cost Calculation of Raw Materials Raw Material Inventory (TIC)

The calculation of raw material inventory costs using the Economic Order Quantity (EOQ) method needs to be done to find out how much cost can be saved in the inventory management process at Rumah Kopi Baik. In this case, the main goal is to get the lowest Total Inventory Cost (TIC) calculation, which will reflect the total cost incurred by the company to store raw materials. The EOQ method aims to determine the most efficient order quantity, so as to reduce inventory costs that arise due to ordering and storage. In calculating TIC, there are two main components that must be considered, namely ordering costs and storage costs. The calculation of total inventory costs according to the EOQ method will be calculated using the Total Inventory Cost (TIC) formula as follows:

COFFEE	TEA
$TIC = (\frac{D}{Q} \text{ x } s) + (\frac{Q}{2} \text{ x } H)$	$TIC = (\frac{D}{Q} \text{ x } s) + (\frac{Q}{2} \text{ x } H)$
$TIC = (\frac{184}{58,953} \text{ x } 520.000) + (\frac{58,953}{2} \text{ x } 50.271,7)$	$TIC = (\frac{75}{16,775} \text{ x } 231.400) + (\frac{16,775}{2} \text{ x } 123.333,3)$
= 1.622.987,8 + 1.481.833,7	= 1.034.575,2 + 1.034.458
= 3.104.821,5	= 2.069.033,2

So the total cost of coffee and tea raw material inventory that must be borne by Rumah Kopi Baik according to the EOQ method in June-October 2024 is IDR 3,104,821.5 for coffee and IDR 2,069,033.2 for tea. Meanwhile, the calculation of total inventory costs according to Rumah Kopi Baik will be calculated using the average inventory available at that location, here is the formula used:

COFFEE	TEA
TIC = (order frequency x S) + (average inventory x H)	TIC = (order frequency x S) + (average inventory x H)
= (5 x 520.000) + (40 x 50.271,7)	= (5 x 231.400) + (17,8 x 123.333,3)
= 2.600.000 + 2.010.868	= 1.157.000 + 2.195.332,74
= 4.610.868	= 3.352.332,74

So, the inventory costs incurred by Rumah Kopi Baik in June-October of the year 2024 is Rp. 4,610,868 for coffee and Rp. 3,352,332.74 for tea. It can be seen the difference in total inventory costs at Rumah Kopi Baik with the total inventory costs according to EOQ.

Table 7. Comparison of Total Inventory Costs Based on Rumah Kopi Baik Policy and Based on the Economic Order Quantity (EOQ)

Year	Raw Materials	Rumah Kopi Baik Policy	EOQ Method	Difference
2024	Coffee	Rp. 4.610.868	Rp 3.104.821,5	Rp. 1.506.046,5
	Tea	Rp. 3.352.332,74	Rp 2.069.033,2	Rp. 1.283.299,54

Source: Rumah Kopi Baik

Based on the table above, Rumah Kopi Baik incurred total inventory costs in June-October 2024 of Rp. 4,610,868 for coffee and Rp. 3,352,332.74 for tea. While the total inventory cost incurred by Rumah Kopi Baik if applying the EOQ method is Rp 3,104,821.5 for coffee and Rp 2,069,033.2 for tea. The difference in costs incurred if Rumah Kopi Baik applies the EOQ method is Rp. 1,506,046.5 for coffee and Rp. 1,283,299.54 for tea. This shows that there is a saving in total inventory costs if Rumah Kopi Baik applies the EOQ method.

Results of Calculation of Economic Order Quantity (EOQ), Safety Stock, ReOrder Point (ROP), Total Investory Cost (TIC) Methods

Based on calculations using the Economic Order Quantity (EOQ), Safety Stock, ReOrder Point (ROP), and Total Inventory Cost (TIC) methods, Rumah Kopi Baik purchases raw materials 5 times in 5 months, with an average purchase of 40 kg of coffee and 17.8 kg of tea. When compared to the EOQ method, Rumah Kopi Baik will purchase coffee raw materials 3 times with a total of 58.953 kg and tea 4 times with a total of 16.775 kg. In terms of purchase frequency, the EOQ method produces lower costs compared to the previous method. Purchases of coffee raw materials which initially cost Rp. 4,610,868 were reduced to Rp. 3,104,821.5, and purchases of tea which were previously Rp. 3,352,332.74 became Rp. 2,069,033.2.

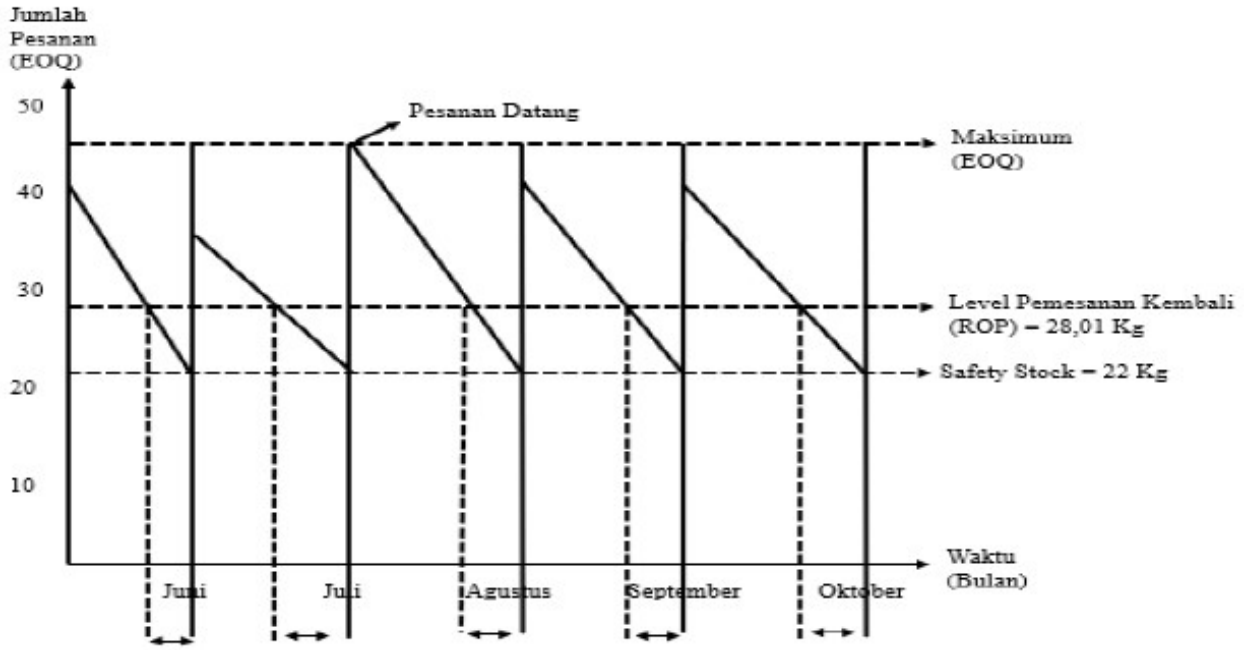


Figure 3 EOQ Model Image (COFFEE)

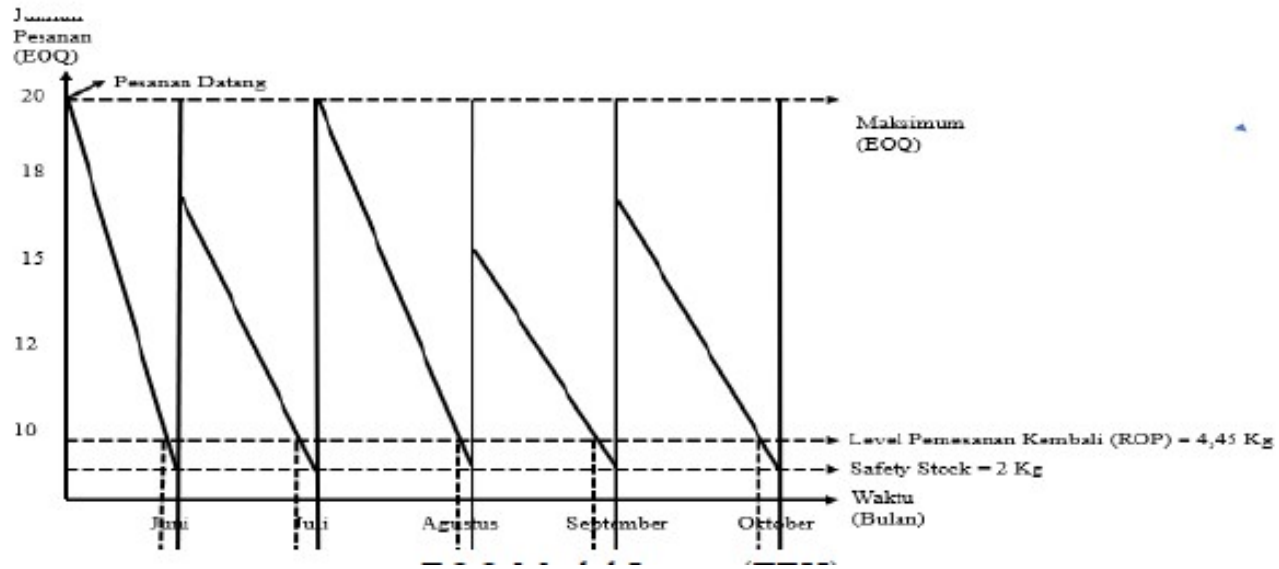


Figure 4. EOQ Model Image (TEH)

Warehouse Balance

The Warehouse Balance is carried out by the Warehouse department which contains data on the quantity of goods stored in the Warehouse along with transactions, both incoming and outgoing goods. The warehouse balance after the control with the EOQ method is as follow:

Table 8. Warehouse Balance

Warehouse Balance after inventory control with the EOQ method						
WAREHOUSE BALANCE						
COMPANY NAME:				ROP :		
House Coffee Baik				Coffee : 28,01 Kg Tea : 4,45 Kg		
EOQ : Coffee : 58,953 Kg Tea : 16,775 Kg				SS : Coffee : 22 Kg Tea : 2 Kg		
MONTH	Raw Materials	Beginning Inventory	Purchase	Usage	Ending Inventory	Description
1	Coffee	28,01 Kg	58,953	38	48,963	ROP
	Tea	4,45 Kg	16,775	15,5	5,725	ROP
2	Coffee	48,963	58,953	31	76,898	ROP
	Tea	5,725	16,775	14	8,5	ROP
3	Coffee	76,898	58,953	42	93,851	ROP
	Tea	8,5	16,775	17,5	7,775	ROP
4	Coffee	93,851	58,953	35	117,804	ROP
	Tea	7,775	16,775	13,5	11,05	ROP
5	Coffee	117,804	58,953	38	138,757	ROP
	Tea	11,05	16,775	14,5	13,325	ROP
Total	Coffee	337,516	294,765	184	476,273	
	Tea	33,05	83,875	75	46,375	
Average	Coffee	84,379	58,953	36,8	95,2546	
	Tea	8,2625	16,775	15	9,275	

Source: Rumah Kopi Baik

After the Warehouse balance sheet is made, the efficiency of purchasing raw materials for Rumah Kopi Baik before using the EOQ method can be seen as 200 kg of coffee and 89 kg of tea. After using the EOQ method, it is 294,765 kg of coffee and 83,875 kg of tea. So it can be seen that the efficiency of purchasing raw materials using the EOQ method is 94,765 kg for coffee and 5,125 kg for tea.

DISCUSSION

Table 9. Comparison of Raw Material Control Based on Rumah Kopi Baik Policy and Based on Economic Order Quantity (EOQ) Method Calculation

No.	Description	Raw Materials	Rumah Kopi Baik Policy	EOQ Method
1.	Coffee Purchase Quantity	Coffee	40 Kg	58,953 Kg
		Tea	17,8 Kg	16,775 Kg
2.	Coffee Purchase Frequency	Coffee	5 time	3 time
		Tea	5 time	4 time
3.	Coffee Safety Stock	Coffee		22 Kg
		Tea		2 Kg
4.	Coffee Reorder Point	Coffee		28,01 Kg
		Tea		4,45 Kg
5.	Total Coffee Inventory Cost	Coffee	Rp 4.610.868	Rp 3.104.821,5
		Tea	Rp 3.352.332,74	Rp 2.069.033,2

Source: Rumah Kopi Baik

Based on data obtained from Rumah Kopi Baik, it is known that the purchase of coffee and tea raw materials still depends on purchase estimates, raw material stock in the warehouse, and market demand, so that purchases made tend to fluctuate and are unstable. This is evidenced by the highest purchase of raw materials that occurred in August 2024 with a total of 45 kg of coffee and June with 20 kg of tea, while the lowest purchase occurred in July 2024 with 35 kg of coffee and September with 15 kg of tea. The purchasing practices carried out by Rumah Kopi Baik are less efficient and have caused the stock of coffee and tea raw materials in the warehouse to increase, as reflected in the highest stock recorded in August 2024 of 45 kg of coffee and June of 20 kg of tea. Therefore, the implementation of a more efficient raw material purchasing method is very important for Rumah Kopi Baik, in order to

manage stock in the warehouse, reduce storage costs, and save raw material ordering costs. One method that can be used to increase the efficiency of raw material inventory is to use the Economic Order Quantity (EOQ) method. The application of the EOQ method can help reduce the cost of purchasing raw materials, optimize the amount of raw materials used in production, and minimize the risk of shortages or excess stock during the production process. Based on the calculations carried out, a comparison can be seen between Rumah Kopi Baik's raw material purchasing policy and calculations using the EOQ method, which includes the quantity of raw material purchases, total inventory costs, purchase frequency, safety stock, and reorder points. This comparison shows which method is more efficient in managing raw material inventory, and can be seen in the comparison table of Rumah Kopi Baik's policy with the EOQ method calculation for the period June to October 2024.

From the table, the difference in raw material inventory control between the policy implemented by Rumah Kopi Baik and the calculation using the EOQ method can be seen. Based on the EOQ calculation, Rumah Kopi Baik will purchase raw materials when the stock reaches 28.01 kg of coffee and 4.45 kg of tea. With a lead time for ordering raw materials that requires 1 day, the remaining inventory in the warehouse is 22 kg of coffee and 2 kg of tea. This shows that the smooth production process of Rumah Kopi Baik is maintained because the stock in the warehouse is sufficient to cover the needs during the waiting period for ordering raw materials until they arrive at the warehouse.

The results of the analysis also show that the EOQ method is more profitable in terms of saving inventory costs and is much more efficient than the policy implemented by Rumah Kopi Baik. The total inventory cost in 2024 according to the EOQ calculation is lower than the inventory cost incurred by Rumah Kopi Baik. The coffee inventory cost using the EOQ method was recorded at IDR 3,104,821.5, and the tea inventory cost was IDR 2,069,033.2, which is lower than the Rumah Kopi Baik policy which incurred coffee inventory costs of IDR 4,610,868 and tea of IDR 3,352,332.74. Based on this analysis, it can be concluded that the control of raw material inventory implemented by Rumah Kopi Baik is still not effective.

CONCLUSION

Based on the results of the analysis and discussion conducted by the researcher, currently the method used by the company is not efficient because the total inventory costs incurred by the company are quite large. We can see below the differences in methods that are very good to be applied to the Rumah Kopi Baik company:

1. Based on the results of inventory control using the EOQ (Economic Order Quantity) method, the minimum order size in controlling raw material inventory using the EOQ method is 58.953 kg of

coffee and 16.775 kg of tea with a total inventory cost of Rp 3,104,821.5 for coffee and Rp 2,069,033.2 for tea.

2. The company's ordering frequency is still the same if previously 5 orders in 5 months, and calculated using the EOQ (Economic Order Quantity) method, orders become minimal with 3 coffee orders in 5 months and 4 tea orders in 5 months.
3. Based on the results of the amount of safety stock for the next period that must be in the warehouse so that there is no stock out for raw materials of coffee of 22 kg and tea of 2 kg.
4. The reorder point (ROP) reorder time that must be carried out by the Home Industry company is 28.01 kg for coffee and 4.45 kg for tea.

SUGGESION

After calculating and analyzing the problems at Rumah Kopi Baik, the author provides several suggestions that can be considered in the raw material inventory policy, including:

1. Rumah Kopi Baik Company, especially the storage section, needs to implement safety stock to avoid shortages of raw materials during the production process. In addition, it is important to determine the right time and schedule for reordering raw materials to ensure smooth production.
2. The company should adopt the EOQ method in managing raw material inventory, compared to the current estimation method, because the EOQ method allows the company to purchase raw materials in optimal quantities and at more efficient costs than the current policy.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Bintang Putra Dzil Ikrom: Conceptualization, Supervision, Data Curation, Formal Analysis, Project Administration, Writing-original Draft, Writing-review Editing, Conceptualization, Resources, Software, Validation, Visualization, and Writing-review Editing. **Nuh Kartini**: Funding Acquisition, Investigation, Writing-original Draft, and Writing-review Editing.

DECLARATION OF COMPETING INTEREST

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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DATA AVAILABILITY

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